IN THE CLAIMS

1. (Currently Amended) A method of removing a photoresist layer comprising:

positioning a substrate comprising a photoresist layer into a processing chamber;

removing the photoresist layer using a plasma;

monitoring the plasma for both a hydrogen optical emission and an oxygen optical emission during the process; and

stopping the etching upon either the hydrogen optical emission obtaining a first level or the oxygen optical emission obtaining a second level, or both; and

determining from at least one of the monitored optical emissions whether a cleaning cycle is necessary, whether components within the chamber are degrading, or both.

2. (Original) The method of claim 1 wherein the photoresist layer comprises a hardened crust layer.

3-5. (Cancelled)

6. (Original) The method of claim 2 wherein the monitoring step produces a signal having a first level while etching the crust and produces a signal having a second level after the crust has been removed.

7. (Original) The method of claim 1 wherein the hydrogen optical emission occurs at a wavelength of about 656 nm.

8. (Cancelled)

9. (Previously Presented) The method of claim 1 wherein the oxygen optical emission occurs at a wavelength of about 777 nm.

10. (Original) The method of claim 1 further comprising:

stopping the etching upon the hydrogen optical emission obtaining a predetermined level.

11-14. (Cancelled)

13. (Previously Presented) The method of claim 2 wherein the oxygen optical emission monitoring step produces an oxygen optical emission signal having a first level while etching the crust and a second level after the crust is removed.

14. (Original) The method of claim 13 wherein the oxygen optical emission signal has a third level after the photoresist is removed.

15. (Previously Presented) The method of claim 1 wherein the hydrogen optical emission is correlated with the oxygen optical emission.

16. (Currently Amended) A method of etching a photoresist layer comprising:

providing a substrate comprising a photoresist layer to a process chamber;

etching the photoresist layer using a plasma; ~~and~~

monitoring the plasma for both a hydrogen optical emission and an oxygen optical emission while etching; and

determining from at least one of the monitored optical emissions whether a cleaning cycle is necessary, whether components within the chamber are degrading, or both.

17. (Original) The method of claim 16 wherein the photoresist layer comprises a crust.

18-20. (Cancelled)

21. (Original) The method of claim 16 wherein the hydrogen optical emission occurs at a wavelength of about 656 nm.

22. (Original) The method of claim 16 wherein the oxygen optical emission occurs at a wavelength of about 777 nm.

23-25. (Cancelled)

26. (Original) The method of claim 16 wherein the hydrogen optical emission is correlated with the oxygen optical emission.

27. (Cancelled)

28. (Currently Amended) The method of claim 1 [[27]], further comprising:
comparing the monitored optical emissions to a fingerprint of a clean chamber.

29. (Cancelled)

30. (Currently Amended) The method of claim 16 [[29]], further comprising:
comparing the monitored optical emissions to a fingerprint of a clean chamber.

31. (New) The method of claim 16, wherein the determining step further comprises:
determining the condition of a plasma source.

32. (New) The method of claim 16, wherein the determining step further comprises:
determining the condition of an inner surface of the processing chamber.

33. (New) The method of claim 1, wherein the determining step further comprises:
determining the condition of a plasma source.

34. (New) The method of claim 1, wherein the determining step further comprises:
determining the condition of an inner surface of the processing chamber.

35. (New) A method of etching a photoresist layer comprising:
providing a substrate comprising a photoresist layer to a process chamber;
etching the photoresist layer using a plasma;
monitoring the plasma for at least one optical emission while etching; and
determining from at least one of the monitored optical emissions whether a cleaning cycle is necessary, whether components within the chamber are degrading, or both.

36. (New) The method of claim 35, wherein the monitoring step further comprises:
monitoring the plasma for a hydrogen optical emission while etching.

37. (New) The method of claim 36, wherein the monitoring step further comprises:
monitoring the plasma for an oxygen optical emission while etching.

38. (New) The method of claim 35, wherein the monitoring step further comprises:
monitoring the plasma for an oxygen optical emission while etching.

39. (New) The method of claim 35, wherein the determining step further comprises:
determining the condition of a plasma source.

40. (New) The method of claim 35, wherein the determining step further comprises:
determining the condition of an inner surface of the processing chamber.